

ACL 2017

**The First Workshop on Neural Machine Translation**

**Proceedings of the Workshop**

August 4, 2017  
Vancouver, Canada



©2017 The Association for Computational Linguistics

Order copies of this and other ACL proceedings from:

Association for Computational Linguistics (ACL)  
209 N. Eighth Street  
Stroudsburg, PA 18360  
USA  
Tel: +1-570-476-8006  
Fax: +1-570-476-0860  
[acl@aclweb.org](mailto:acl@aclweb.org)

ISBN 978-1-945626-68-5

## Introduction

Welcome to the ACL Workshop on Neural Machine Translation. This is a new annual workshop focusing on Neural Machine Translation (NMT) technology, a simple new architecture for getting machines to learn to translate. Despite being relatively recent, NMT has demonstrated promising results and attracted much interest, achieving state-of-the-art results on a number of shared tasks. This workshop aims to cultivate research in neural machine translation and other aspects of machine translation and multilinguality that utilize neural models.

In this year's workshop we are extremely fortunate to be able to host four invited talks from leading lights in the field, namely: Chris Dyer, Alexander Rush, Kevin Knight and Quoc Le. In addition the workshop will feature a panel discussion to discuss the burning issues in the field.

We received a total of 24 submissions, and accepted 15 for inclusion in the workshop. Due to the large number of invited talks, and to encourage discussion, only the two papers selected for best paper awards will be presented orally, and the remainder will be presented in a single poster session.

We would like to thank all authors for their submissions, and the program committee members for their valuable efforts in reviewing the papers for the workshop. We would also like to thank Google for their generous sponsorship.



**Organizers:**

Minh-Thang Luong, Google Brain  
Alexandra Birch, University of Edinburgh  
Graham Neubig, Carnegie Mellon University  
Andrew Finch, Apple Inc.

**Program Committee:**

Michael Auli, Facebook  
Trevor Cohn, University of Melbourne  
Kevin Duh, JHU  
Long Duong, University of Melbourne  
Francisco Guzman, CSRI  
Barry Haddow, Edinburgh  
Cong Duy Vu Hoang, University of Melbourne  
Sébastien Jean, Montreal  
Hidetaka Kamigaito, Titech  
Yuta Kikuchi, Titech  
Kevin Knight, USC/ISI  
Lemao Liu, Tencent AI Lab  
Shujie Liu, Microsoft  
Chris Manning, Stanford  
Hideya Mino, NICT  
Preslav Nakov, QCRI  
Hieu Pham, Google  
Abigail See, Stanford  
Rico Sennrich, Edinburgh  
Kubosawa Shumpei, NICT  
Akihiro Tamura, Ehime University  
Rui Wang, NICT  
Taro Watanabe, Google  
Xiaolin Wang, NICT

**Invited Speakers:**

Chris Dyer, Deepmind  
Kevin Knight, (USC/ISI)  
Quoc Le, Google Brain  
Alexander Rush, Harvard

**Panelists:**

Chris Dyer, Deepmind  
Kevin Knight, (USC/ISI)  
Quoc Le, Google Brain  
Alexander Rush, Harvard  
Kyunghyun Cho, New York University



## Table of Contents

<i>An Empirical Study of Adequate Vision Span for Attention-Based Neural Machine Translation</i> Raphael Shu and Hideki Nakayama .....	1
<i>Analyzing Neural MT Search and Model Performance</i> Jan Niehues, Eunah Cho, Thanh-Le Ha and Alex Waibel .....	11
<i>Stronger Baselines for Trustable Results in Neural Machine Translation</i> Michael Denkowski and Graham Neubig .....	18
<i>Six Challenges for Neural Machine Translation</i> Philipp Koehn and Rebecca Knowles .....	28
<i>Cost Weighting for Neural Machine Translation Domain Adaptation</i> Boxing Chen, Colin Cherry, George Foster and Samuel Larkin .....	40
<i>Detecting Untranslated Content for Neural Machine Translation</i> Isao Goto and Hideki Tanaka .....	47
<i>Beam Search Strategies for Neural Machine Translation</i> Markus Freitag and Yaser Al-Onaizan .....	56
<i>An Empirical Study of Mini-Batch Creation Strategies for Neural Machine Translation</i> Makoto Morishita, Yusuke Oda, Graham Neubig, Koichiro Yoshino, Katsuhito Sudoh and Satoshi Nakamura .....	61
<i>Detecting Cross-Lingual Semantic Divergence for Neural Machine Translation</i> Marine Carpuat, Yogarshi Vyas and Xing Niu .....	69





# Workshop Program

**Friday, August 4, 2017**

## **Session 1**

**09.30—**      *Welcome and Opening Remarks*  
**09.40**

**09.40—**      *Keynote - Chris Dyer*  
**10.30**

*10.30—11.00 Coffee Break*

## **Session 2**

**11.00—**      *Keynote - Alexander Rush*  
**11.50**

**11.50—12.20**    *Best Paper Session*

*12.20—13.40 Lunch Break*

## **Session 3**

**13.40—**      *Keynote - Kevin Knight*  
**14.30**

**14.30—**      *Keynote - Quoc Le*  
**15.20**

Friday, August 4, 2017 (continued)

Session 4

15.20—  
15.30      *Poster Session*

*An Empirical Study of Adequate Vision Span for Attention-Based Neural Machine Translation*

Raphael Shu and Hideki Nakayama

*Analyzing Neural MT Search and Model Performance*

Jan Niehues, Eunah Cho, Thanh-Le Ha and Alex Waibel

*Stronger Baselines for Trustable Results in Neural Machine Translation*

Michael Denkowski and Graham Neubig

*Six Challenges for Neural Machine Translation*

Philipp Koehn and Rebecca Knowles

*Cost Weighting for Neural Machine Translation Domain Adaptation*

Boxing Chen, Colin Cherry, George Foster and Samuel Larkin

*Detecting Untranslated Content for Neural Machine Translation*

Isao Goto and Hideki Tanaka

*Beam Search Strategies for Neural Machine Translation*

Markus Freitag and Yaser Al-Onaizan

*An Empirical Study of Mini-Batch Creation Strategies for Neural Machine Translation*

Makoto Morishita, Yusuke Oda, Graham Neubig, Koichiro Yoshino, Katsuhito Sudoh and Satoshi Nakamura

*Detecting Cross-Lingual Semantic Divergence for Neural Machine Translation*

Marine Carpuat, Yogarshi Vyas and Xing Niu

**Friday, August 4, 2017 (continued)**

*Domain Aware Neural Dialogue System (extended abstract)*

Sajal Choudhary, Perna Srivastava, Joao Sedoc and Lyle Ungar

*Interactive Beam Search for Visualizing Neural Machine Translation (extended abstract)*

Jaesong Lee, JoongHwi Shin and Jun-Seok Kim

*Graph Convolutional Encoders for Syntax-aware Neural Machine Translation (extended abstract)*

Joost Bastings, Ivan Titov, Wilker Aziz, Diego Marcheggiani and Khalil Sima'an

*Towards String-to-Tree Neural Machine Translation (cross-submission)*

Roei Aharoni and Yoav Goldberg

*What do Neural Machine Translation Models Learn about Morphology? (cross-submission)*

Yonatan Belinkov, Nadir Durrani, Fahim Dalvi, Hassan Sajjad and James Glass

*Trainable Greedy Decoding for Neural Machine Translation (cross-submission)*

Jiatao Gu, Kyunghyun Cho and Victor O.K. Li

**15.30—** *Poster Session (continued) and Coffee Break*

**16.10**

**Session 5**

**16.10—** *Panel Discussion*

**17.30**

*17.30—17.40 Closing Remarks*

